

VOL. 5 NO. 5

MAY 1983

\$2.00

neat notes

THE NEWSLETTER OF NEW ENGLAND APPLE TREE

May 1983 N.E.A.T. Meeting

The May meeting will be held at 7:30 P.M. on the third Wednesday of the month (as usual), May 18, 1983 at the Mitre cafeteria. Mitre is on rte 62 in Bedford Ma. Take route 3 north from rte 128 to the first exit (rte 62).

16,000
pages

MAY'S PROGRAM

Bette M. Winer will present a discussion of the Novation Apple Cat Modem and give a demonstration using a local computer bulletin board system. If you have been thinking of getting a modem for your Apple, this program and the article on page 7 of this newsletter will go a long way towards answering many of your questions.

FUTURE SCHEDULE IS TENTATIVELY AS FOLLOWS:

June 15, 1983-----Dave Scettalia,
NIBBLE Tech Editor

July 20, 1983-----LISA, Jim Miller

August 17, 1983-----68000 in an Apple,
Joe Stivaletta

September 21, 1983-----CompuServ

October 19, 1983-----

November 16, 1983-----

December 21, 1983-----

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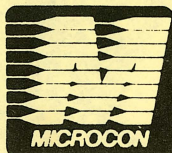
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THE NEWSLETTER OF NEW ENGLAND APPLE TREE

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HELP !!!

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MAY HIGHLIGHTS

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N.E.A.T. Meeting - March 30, 1983
by Jeannine Giffiee

Present: Dave Reed, Joe Stivaletta, Lou Tarsa, Jeannine Giffiee, Larry Starnes.

ANNOUNCEMENTS - Saugus High School had a Computer Fair on April 8 from 9 a.m. to 8 p.m. Unfortunately they informed us too late for N.E.A.T. to organize a representative appearance for the promotion of our club.

IAC is offering personal computer insurance. See Dave Reed for an application form.

N.E.A.T. received a letter from a Belgium company announcing their attempt to organize computer camps in Europe this summer and they are looking for 18-20 year old counselors who are knowledgeable about the APPLE and programming languages. See Dave Reed for more information.

Dave received a book in the mail for the group to review entitled "Computers - A Comprehensive Guide". It is available for your review and it costs \$2.00 to purchase.

In response to the person looking for Wagner's articles on assembly language in the early issues of Softalk, these articles are also available in book form. The book can be found in a number of APPLE computer stores in the Boston area.

John Shaw and Elliot Entin have volunteered to co-chair APPLEFEST this year and are looking for some volunteers from membership to help man the booth. These people will receive free show passes for the day they come in to help.

The show goes from May 13th through the 15th. John made a plea for about 15-20 volunteers at the meeting. Only two people responded to his request at that meeting. Pretty Poor!

Elections are coming up in May. All of the offices are open. Presently these include the President, Treasurer, 2 Vice Presidents, and Secretary. None of the incumbents will be running for re-election so here's your chance. The club's need for participation includes more than the efforts of the people in these positions to survive, let alone grow and so we would like to suggest some of the other means by which you may help. These positions were described in last month's issue of N.E.A.T. NOTES.

Production Staff/Newsletter
Editors/Writers/Newsletter
Advertising Managers/Newsletter
Distribution Manager/Newsletter
Store Distribution/Newsletter
Archivist
IAC Liason
Software Librarian
Software Reviewers/Newsletter
DOM Production
Software Sales
Equipment Coordinators

As you can plainly see there is obvious need for your increased interest and involvement in the club and there is ample opportunity for you to select an activity which you think best suits your interests and talents. Please seriously consider these positions. If you have any questions about these please feel free to call on a club officer to discuss them. We'd love to hear from you!

N.E.A.T.
Steering Committee Meeting
April 6, 1983
By Jeannine Giffiee

Present: Dave Reed, Jerry
Connelly, Jeannine Giffiee, Mike
Gooding.

Topics for discussion: 1)
Status of available positions
within the club, and 2)
Elections.

VOLUNTEERS - Four people have
volunteered their time to help
with the following positions:

Andy Dumaine - IAC Liason
Steve Meuse - IAC Liason

(Steve will serve this position
since Andy is available only
until August. Thank you Andy
Dumaine for offering your
time!)

Ed Fournier - Archivist
Jack Thompson - Greeter

Thank you all for contributing
your time to the club!

ELECTIONS - Since the majority
of the present officers are not
running for re-election, we are
seeking other members for
nomination. We could only
think of two.

CALENDAR

Compiled by Raines Cohen

May 2 7:00PM
NEAT Steering Committee Meeting
Jerry Connelly's Office
call 497-9050
May 4 7:00PM
New England Computer Society
Mitre Cafeteria
call 646-3080

May 13-15 10:30AM-5:30PM
APPLEFEST/BOSTON
Bayside Exposition Center
call 800-841-7000

May 14 10:00AM
North Shore Apple Group
Computer City, Danvers
call 546-3104

May 18 7:30PM
New England Apple Tree
Mitre Cafeteria
call 497-9050

May 21 9:30AM
Apple Guild
Massasoit Community College
call 767-1303

May 25 7:30PM
Boston Computer Society
New England Life Hall
call 367-8080

May 27 7:30PM
PASCAL Boston Computer Society
MIT 1-150
call 367-8080

May 28 2:30PM
Newton Apple Kids
Newton Free Library
call 965-0033

June 1 7:00PM
New England Computer Society
Mitre Cafeteria
call 646-3080

June 3-5 10:30AM-5:30PM
East Coast Computer Faire
Hynes Auditorium
call 739-2000

June 6 7PM
NEAT Steering Committee Meeting
Place to be determined
call 497-9050

June 11 10:00AM
North Shore Apple Group
Computer City, Danvers
call 546-3104

June 15 7:30PM
New England Apple Tree
Mitre Cafeteria
call 497-9050

April 17 9:30AM
Apple Guild
Massasoit Community College
call 767-1303

N.E.A.T. Meeting
April 20, 1983
by Jack Sheehan

Present: Lou Tarsa, Dave Reed,
Joe Stivaletta, Larry Starnes,
Jack Sheehan.

Lou Tarsa called the meeting to order at 8:04 and introduced new members to the group. Dave Reed announced that there were no volunteers to run for office. Lou Tarsa felt that it was time for new blood to be introduced into the leadership. The present officers have been involved in the group for about five years. Dave Reed mentioned that he sent away for a storage box from StorWares. It is little more than a cardboard box with fancy paper on the outside and holds 75 diskettes. The cost is \$9.95 and that is the main thing that recommends it. Terry Scheller stated that he would be willing to run for office.

This month's DOM is from the IAC and is an Educational disk containing counting and math programs for kids. It is the first disk from one of their SIGs and we expect to see more of this in the future.

Volunteers were again sought for AppleFest. For volunteering for 3 hours of booth duty you will receive, a free pass to AppleFest for the day.

Roger Greenburg of MicroDent announced that he will have a sale Fri-Sun April 30-May 2 and some items will be priced 30 to 80% off. Hardware, software, and Computer systems will be available but quantities will be limited.

PROGRAM

Integral Data Systems presented a demonstration of their printers. They introduced the Prism system starting at \$1299. They offer 3 different modules with their printers. They use a ballistic style printhead that gives daisy quality with a dot matrix. There is a 1.4k buffer, graphics is standard and speed is 75cps. It also has a screen dump facility called Prism Magic. IDS was the Paper Tiger manufacturer. The three areas the Prism Printer addressed was the quality of type, ease of loading and changing paper and ease of getting to printhead.

Color graphics is also offered. Printer has backing up capability (reverse tractor feed) and IDS feels it is close to an all purpose printer. The printer will print on acetate if you want to make overhead transparencies. The resolution of the printer is 84 dots/in on both directions. The printhead has a 1 year warranty and 250 million characters is the average life. The printhead is also easy to replace. A low price printer was also on display. There is also a 3.4K buffer available as an option on the larger machine. IBM markets this printer as a printer/plotter. Besides having color graphics you may have colored text. the machine has four fonts.

NEAT ELECTIONS IN MAY!!

NOVATION APPLE CAT

by
Bette M. Winer

The purpose of this article is to complement the program for the May meeting, a discussion of Novation's Apple Cat and a demonstration of the unit using a local computer bulletin board system. I have tried to build upon and extend the excellent review of the Apple Cat in the January, 1983 issue of BYTE Magazine. The local, free bulletin board systems to be demonstrated is CBBS-Boston, sponsored by the New England Computer Society, the original sponsoring organization for NEAT.

An excellent description and pictures of the Novation Apple Cat hardware and its accessories is presented in the Byte article. This discussion assumes that the reader has read it. However, the BYTE description of COM-WARE II, the terminal package that comes free with the Apple Cat, is cryptic and out of date.

COM-WARE II (Version 5.0) seems to be an excellent program to compliment an excellent product. I have compared its features with those of ASCII Express and am impressed. COM-WARE allows you to use your Apple as a dumb terminal, as a data capture terminal, as a printing terminal, etc and to operate your Apple from a remote terminal. All but the last of these features can be exercised with the press of a single key once you are in the command level.

The command level is entered by pressing the <ESC> key once; the menu of single key commands (see list of commands) is obtained when the program is originally booted or by pressing

<ESC> a second time. This process interrupts any conversation that you might be having at the time, but does not disconnect you. In this way, you can convert from a dumb terminal to feeding information into memory and/or printing it out while remaining connected. You can also change from voice mode to terminal mode without redialing.

When you install the CAT and boot COM-WARE II for the first time, you must re-configure the terminal instructions to match your system and application. For example, COM-WARE assumes that you have placed the CAT in Slot 2 and will sound an alarm if it doesn't find it in that slot. If this is your first introduction to the equipment, the alarm can be quite annoying. To turn it off after the initial boot, press <R>. You will then see the following sub-menu:

RE-CONFIGURE CHARACTERISTICS

- (0) TERMINAL CHARACTERISTICS
 - (1) 103 CHARACTERISTICS
 - (2) 212 CHARACTERISTICS
 - (3) PRINTER CHARACTERISTICS
 - (4) SAVE TO DISK
- CHOICE(0-4):0

Press RETURN to re-configure the terminal, or <ESC> to return to Command level. The first sub-sub level menu will allow you to change the assumptions concerning the Slot Number and stop the annoying beeping. The remaining sub-menus will allow you to tell the program whether or not you have an 80-column card, touch-tone or pulse dialing, the default baud rate, etc.

After setting all the Terminal Characteristics, the sub-menu above will return to allow configuration of the signal (103 characteristics) to

conform to the needs of the receiving computer. (Press <1> and <C/R>.) While the documentation is clear, it fails to tell you what configuration the Source, Compu-serve and the Bulletin Boards are expecting. I called the 800-number provided with the CAT to determine what parameters the Novation computer requires; using those parameters solved my problem. The characteristics, in the order in which they will be encountered are as follows:

1. AUTO SEARCH (DEFAULT)
2. 300 (DEFAULT)
3. 7 BITS
4. 1 STOP BITS (DEFAULT)
5. PARITY NOT ENABLED (D)

Only the third item differs from the default values, but this is not clear from the documentation. At this point, the program returns to the sub-menu above.

Since I do not have the part of the CAT that allows the use of 1200 baud, Bell 212 communications protocol, I have no insight into the parameters that must be chosen for that board. The default values for the printer apply to having the printer attached to a card in Slot 1. Save these modified characteristic to disk (Press <4>.) so that they will be available when COM-WARE is booted next and return to the command level. (Press <ESC>.)

As stated in the BYTE article, the CAT is actually a full communications system. For example, you can attach a conventional telephone handset to the CAT and (by using <G>) establish voice communications with your destination prior to establishing a data connection with the computer. Once the data connection is made, the speaker should be toggled off <G> so

that stray noise cannot interrupt the data flow. This is very convenient if you want to determine when failure to make connection is caused by a busy line; i.e. the same approach used with acoustic couplers. Novation sells handsets for \$19; however, any modular handset that does not have a dialing mechanism can be disconnected from an existing phone, used, and then replaced.

COM-WARE allows from automatic dialing from a list of phone numbers stored on disk. Press <A> for Autodial and then <L> for list. The sub-menu that comes up allows for selections from the existing list or modifications to that list. The resulting communication can be by voice or with Apple. Should the line be busy, there is a provision for redialing the last number <R> as many times as necessary to get through. WARNING: computer calls tend to be much longer than voice calls. Unless you know that the number you are calling has several incoming lines, it is seldom worth while to use the re-dial feature. You will just tie up your own line; once you dial another number, you must return to the list to re-dial the original number.

There are two ways to use the CAT and COM-WARE II to capture data off the line for later use. If the data is in the form of text that you want to read later, the information can be sent directly to the printer as it comes over the line (use <Z> to toggle the printer on). This is very useful for storing the menus for a Bulletin Board so that you won't need to have them reprinted each time. At 300 baud, that can be quit time consuming. Most Bulletin Boards have a provision for an expert user mode that reduces the menu

to a simple list of commands. However, unless you know the commands or have a hard copy, you will have to ask for the instructions anyway.

The second technique for data capture is to send all incoming data to the 27 KByte memory buffer (use <M> instead of <C> to communicate). When the buffer is nearly full, enter command mode (<ESC> stops data receipt without disrupting the connection), save the memory to disc <S>, empty the memory buffer <O>, and return to memory mode <M> to capture the remaining data. This procedure can be followed as often as necessary without disrupting the connection. A true data capture program would do this automatically. (This feature may become available as a patch some time in the future. Updated versions of Novation programs are available directly from the Novation Computer in California for the price of the phone call. The speed of that type of transfer is mind boggling.) You can send information to other computers using the same kind of algorithm and commands <L>, <O> and <X>.

When you store the buffer on the disc, you are given the choice between binary and text files; it all depends on what your favorite word processor requires. If you choose incorrectly, load the file back into memory <L> and resave <S> it in the proper format. If it is an Applesoft program, you will eventually want to store it as a text file. Applewriter requires binary files and file names that begin with <TEXT.>; the November ROM had utility programs to convert Applewriter files to Text that are comparable to the utility programs provided with COM-WARE. Many other word processors can

work with text files directly. (Magic Window requires text files whose names end with <.MW>.

The 27 KByte memory buffer is larger than can be accepted by some word-processors. A 26 KByte text file swamped Magic Window II; this same file was easily accepted by Applewriter 1.1 after the material was resaved as a binary file. It pays to check on you text processor's limits before you take the time to accept such a large file; I haven't discovered how to split files after they have been received and stored to disc.

Use <J>-View Memory to check that you word processor produces files that COM-WARE can use; if the text looks right, COM-WARE will transmit it properly. Other wise, you will have to trick the CAT. This process requires the version of COM-WARE available (#29) in ROM. Use the firmware to establish contact with the receiving computer; then RUN you word processing package. Use your package in the normal way to load files and get ready to PRINT. Tell the processor that the printer to which it is to send ASCII code is located in the slot actually occupied by your CAT. Put in as few carriage returns and line feeds as possible. The receiving computer will then be fed a standard ASCII code file. The word processor on the receiving computer should then be able to store it and take out any extra <C/R>s that might come through. If double spacing is required, that package should be able to add them. This works quite nicely with both the CAT and the Hayes Micromodem II.

CATREMOTE is a program utility that allows you to operate your Apple from a remote terminal. However, it works only if you remain in the BASIC

environment. Unfortunately, binary applications programs transfer control from the modem back to the keyboard, even when using the firmware version of CATREMOTE. When the binary files are read, two software switches are set to make sure that the normal user can access the program from the keyboard; this automatically denies control to the CAT. One member of the Novation staff is working on techniques for solving this problem. The problem with VISICALC is probably more serious; in order to run VISICALC, you must perform a soft boot that wipes CATREMOTE out of memory and disconnects the firmware. I don't know if all spread sheet programs have this same problem.

CATREMOTE, like COM-WARE II, assumes that the CAT is in Slot 2. If you have used a different slot, CATREMOTE won't function. The patch is as follows:

```
J BLOAD CATREMOTE
J CALL -151
* 9214:(SLOT NUMBER)0
* 3DOG
J BSAVE CATREMOTE,A$9200,L$260
```

If Slot 4 is used, line 3 will read 9214:40.

The CAT, with the optional expansion module, also provides for a BSR system to control household appliances. The BSR controller is available from Novation (\$19) and the BSR modules to be controlled can be purchased at Radio Shack, Sears, etc. The BSR control program that is part of the COM-WARE package also assumes that the CAT is in Slot 2. The patch is as follows:

```
J BLOAD BSR
J CALL -151
* 802:(SLOT NUMBER)0
* 3DOG
```

```
J BSAVE BSR,A$800,L$300
```

If the CAT is in Slot 4, line 3 will read 802:40. The BSR concept seems to have caught on well enough to be widely marketed. However, the controller units are more costly (>\$15/unit) than a time clock controller. For that reason, I cannot recommend it.

Once the CAT is installed and configured, it is time to contact another computer. WARNING: there are a great many computer data bases available, featuring a variety of information. It is extremely easy to go into "information overload," wandering aimlessly through these data bases just seeing what is available. If you are paying (e.g. the Source and Compu-Serve), you will soon chew up a great deal of money. I recommend that you investigate the FREE data bases until you are comfortable and then expand into the more costly systems.

The steps required to contact CBBS/BOSTON with your CAT are as follows:

1. BOOT COM-WARE II
2. Press <A> for auto-dial
3. Press <D> for dial
4. Press the numbers 6463610 and <C/R> in Boston area and 16463610 outside Boston
5. See DIALING-6463610
COMMAND --
6. Wait until CARRIER appears at the top of the screen and press <C> for CHAT mode

At this point, the NECS computer will make contact. First it will identify the version of the software it is using, CBBS VER 3.3. Then it will print the date and time and print a greeting message. It will ask if your terminal needs nulls. I have assumed yes and no at various times; for me it makes no

difference. It will then print the following list of control characters accepted by the system:

ASCII CHARS	CTL CHARS	
-		DEL/BS CHARACTER DELETE
C	C	CANCEL OUTPUT (CAN USE TO SKIP THIS)
K	K	FUNCTION ABORT
N	N	SEND 5 NULLS AT BEGINNING OF LINE
	R	REDISPLAY INPUT LN
S	S	SUSPEND/RESTART (PSE TO READ TEXT)
	U	LINE DELETE
FRILLS:		
	W	RETYPE WORD
	L	COLUMN NUMBER

It will then proceed to print the BULLETINS, ask if this is your first time on the system and your name, assign you a number and tell you about the messages on the system. If you had answered that this was your first time on the system, it would provide some background information and then print the following list of commands:

COMMANDS FOR CBBS/BOSTON

A--ALTER BAUD RATE
 B--REPRINT BULLETIN
 C--CASE SWITCH (UPPER/LOWER)
 D--DUPLEX SWITCH (ECHO/NO ECHO)
 E--ENTER MESSAGE INTO SYSTEM
 G--GOOD BYE (LEAVE SYSTEM)
 H--HELP
 K--KILL MSG FROM SYSTEM
 N--NULLS: SET AS MANY AS REQ'D
 P--PROMPT SWITCH (BELL ON/OFF)
 Q--QUICK SUMMARY (MSG#, SUBJECT)
 R--RETRIEVE MSGS BY #
 S--SUMMARIZE MSGS
 T--PRINT DATE, TIME, ELAPSED TIME
 V--VIDEO BACKSPACE
 W--REPRINT WELCOME
 X--EXPERT USER MODE
 #--PRINT CALL #, HI MSG #, #

MSGS

If you had answered that you had been on the system before, it would print:

FUNCTION: A,B,C,...
 ...,X,# (OR ? FOR HELP)

If you press <?>, it will print the list above. If you press <H> for Help, it will ask for a command on the list to explain.

To find out what messages are on the system, press <Q>--Quick Summary or <S>--Summarize messages. It will then ask you for the initial message number. If you have forgotten what message numbers are on the system, return to the main menu and press <#>.

The summary will tell you what messages are available on the system. HINT: write down the numbers of the messages you want to read as they are summarized. I have found it impossible to remember more than two four digit codes while continuing to read the summary. After noting which messages are of interest, press <R> and the number of the message when asked.

Local Bulletin Board Numbers from Apple Tech Notes

ABBS	Boston, Ma	(617) 354-4682
CBBS	Camb., Ma	(617) 864-3819 #24
Forum-80	Nashua, N.H.	(603) 882-5041
Forum-80	Westford, Ma	(617) 692-3973
PMS Apple Guild		
	Weymouth, Ma	(617) 767-1303 #24
RCP/M SuperBrain		
	Lexington, Ma	(617) 862-0781
misc. New England Computer Soc.		
	Maynard, Ma	(617) 646-3610 #24
IBM PC	BCS Subgroup	(617) 484-2594
		6:30PM-8:30AM 300bd

#24 Denotes 24 hour operation

COM-WARE II COMMANDS

<ESC> Enter Command Mode

A -- Autodial
 L--Dial number from list and/or change list.
 D--Direct Dial (up to 56 digits, can stop until senses
 second dial tone and can pause if needed.
 R--Redial last number.
 B -- Prints contents of the 27 KByte buffer memory
 C -- Terminal CHAT mode--dumb terminal
 D -- DOS Access Command
 F -- High-speed data transfer (1200 baud-
 Bell 202 protocol)
 G -- Toggle handset microphone on and off
 H -- Hang up phone
 I -- Toggle local echo to allow or inhibit sending
 keyboard entries to modem and monitor
 simultaneously.
 J -- View contents of memory buffer
 K -- Direct entry from keyboard to memory buffer.
 L -- Load disk file into memory buffer.
 M -- Chat and store all key strokes (transmitted and
 received) in memory buffer.
 O -- Purge memory
 P -- Pick up phone
 Q -- Exit program
 R -- Reconfigure equipment parameters
 S -- Save memory buffer to disk file.
 T -- Toggle transmission speed 103/212/202
 U -- Unattended answer/memory on (memory only)
 V -- Verify memory
 X -- Transmit contents of memory buffer
 Z -- Print copy of all monitor activity

FOR A RAINY DAY

by David Sun

reprinted from Call-A.P.P.L.E.

January 1983 issue

The following program is taken from an article called, "THREE DEE DEMOS," by David Sun. It takes about an hour to run. The interesting part is buried in line 110: HCOLOR =0: HPLOT X1,Y1+1 TO X1,191. This erases everything on the screen in column X1, below the plotted point at X1,Y1. This erases all points which should be hidden in the finished product.

```

10 HOME : HGR2
20 FOR Z = - 120 TO 120 STEP 3
30 XLIMIT = SQR (14400 - Z * Z)
40 FOR X = - XLIMIT TO XLIMIT
50 XO = SQR (X * X + Z * Z) * (3
    .141 / 100)
60 Y = ( SIN (XO) + .75 * SIN (2
    * XO) + 1.5 * SIN (3 * XO)
    ) * 30
70 GOSUB 100
80 NEXT X: NEXT Z
90 END
100 X1 = 130 + (X + Z / 10):Y1 =
    100 - (Y - Z / 10)
105 IF X1 < 0 OR X1 > 279 OR Y1 <
    0 OR Y1 > 191 THEN RETURN
110 HCOLOR= 3: HPLOT X1,Y1: HCOLOR=
    0: HPLOT X1,Y1 + 1 TO X1,191
120 RETURN
  
```

MACHINE LANGUAGE SPOKEN HERE

By Dr. J

The doctor is in.

Hello gang. This month we are going to see how to use two-dimensional arrays from assembly language. But first, let's review that little mystery I left you with in last month's column. For those of you not blessed with photographic memories, the situation was this: we tried to call an assembly language routine to add the elements in a column array:

```
CALL 768,A(0),C,N
```

Everything worked fine as long as the variables A(), C, and N were defined before we executed this statement. However, the machine code failed to work as expected if we forgot to declare the variable C beforehand. Can you guess what went wrong? Not even a little guess?

What happens is this: if the variable C doesn't exist when we call the Applesoft routine PTRGET from our machine language code, Applesoft goes ahead and creates it. In doing so, Applesoft displaces the array A() and moves it to someplace else in memory. The problem is, our machine language routine picked up the pointers to this array's old position. (Remember: A() appears before C in the argument list.) Naturally, these pointers no longer point to A()'s new position, and so our addition routine simply picks up any old garbage that happens to lie around in memory.

Simple, huh? Well, as I warned when we first started on this quest, there are no safety nets in assembly language!

Last month, we saw a very fast array addressing technique called 'linear addressing'. Linear addressing is fast because it simply 'marches' through an entire array in a sequential fashion, one element at a time.

Linear addressing is okay if all of your array routines can use sequential addressing. Since this will not always be the case, we must look to other methods to address an array.

The method we will look at this month is called 'random addressing'. Random addressing simply means we can get to any element within an array without having to step through elements ahead of it. The algorithm for random addressing is really quite simple. If we have dimensioned an array: A(M,N) (so that it really has M+1 rows and N+1 columns), then the address to the element A(I,J) is:

$$\text{BASEADR} + 5 \times (I + J \times (M+1))$$

Where BASEADR is the address to the element A(0,0). The term M+1 is necessary because this array really has M+1 elements per column, even though the dimension statement would have you think it only has M elements per column.

We will demonstrate random addressing with a little exercise to sum all the element in a two-dimensional array. In BASIC we could write this routine as:

```

10 C = 0
20 FOR I = 1 TO M
30 FOR J = 1 TO N
40 C = C + A(I,J)
50 NEXT I
60 NEXT J

```

To do this in machine language we need simply pass the addresses for A(0,0), C, M, and N. The assembly code is shown in Listing #1, and the Applesoft program which calls this routine is shown in Listing #2.

As with all of our assembly codes, we begin by picking up the pointers to the variables passed in the argument list. We will keep the cumulative sum in the floating point accumulator, FAC, for the entire loop, and assign the final value to the variable C only after we finish the loop.

The heart of this routine is in the subroutine **ARRAYPT** which calculates the address to any element A(i,j). Before the machine code calls **ARRAYPT**, the values for indices 'i' and 'j' are stored in two zero-page memory locations labeled I and J. In addition, the true number of elements per column (M+1) is stored in the zero-page location labeled M, and the address to A(0,0) is stored in the two bytes **ARRAYLW** and **ARRAYHI**.

ARRAYPT calculates the address to A(i,j) using the simple formula we presented above. **ARRAYPT** itself uses two other subroutines: **MULT** multiplies the two bytes **MPRAD**, **MPDAD** and leaves the two-byte result in **RSLTLW/RSLTHI**; **MULT5** multiplies the two-byte number **MPDLW/MPDHI**

```

SOURCE FILE: ARRAY ADDR3
0000: 1 ;*****
0001: 2 ;
0002: 3 ; ARRAY ADDR
0003: 4 ;
0004: 5 ;THIS PROGRAM SIMULATES THE
0005: 6 ;BASIC STATEMENTS
0006: 7 ;
0007: 8 ;C=0
0008: 9 ;FOR I=0 TO M
0009: 10 ;FOR J=0 TO N
0010: 11 ;C=C+A(I,J)
0011: 12 ;NEXT J,I
0012: 13 ;PRINT C
0013: 14 ;
0014: 15 ;
0015: 16 ;THE COMMANDS ENTERED FROM
0016: 17 ;BASIC ARE:
0017: 18 ;CALL 768,A(0,0),C,M,N
0018: 19 ;
0019: 20 ;THIS CODE DOES NOT USE LINEAR
0020: 21 ;INDEXING; THAT IS IT INDEXES
0021: 22 ;MUCH AS BASIC WOULD
0022: 23 ;
0023: 24 ;*****
0024: 25 I EQU $0 ; 'I' INDEX
0025: 26 J EQU $1 ; 'J' INDEX
0026: 27 M EQU $2 ; NO. ELEMENTS PER COLUMN
0027: 28 N EQU $3 ; NO. ELEMENTS PER ROW
0028: 29 MPDLW EQU $93
0029: 30 MPDHI EQU $94
0030: 31 RSLTLW EQU $95
0031: 32 RSLTHI EQU $96
0032: 33 MPDAD EQU $97
0033: 34 MPRAD EQU $98
0034: 35 ARRAYLW EQU $E0
0035: 36 ARRAYHI EQU $E1
0036: 37 CLW EQU $E2
0037: 38 CHI EQU $E3

```


by 5 and leaves the two-byte result in RSLTLW/RSLTHI. On return, the low order address to A(i,j) is stored in the ACCUMULATOR, and the high order address is stored in the Y-register.

How fast is this machine language routine compared to an equivalent routine in Applesoft? I did several benchmarks to add the elements in a two-dimensional array; these are presented in the following table:

BENCHMARK RELATIVE SPEED

Applesoft	1
TASC #1	2.4
TASC #2	4.3
ASSEMBLY #1	9.5
ASSEMBLY #2	14.8

TASC #1 is a compiled version of the Applesoft program which does not use TASC's integer arithmetic option. TASC #2 uses the integer arithmetic option. (Normal array indexing uses floating point arithmetic to calculate the array address; the integer option uses faster integer arithmetic.) ASSEMBLY #1 is the version shown in Listings 1&2, while ASSEMBLY #2 uses linear addressing.

What I found amazing about this benchmark is that even the relatively slow random addressing scheme will give you a 10-fold increase in speed over Applesoft. In fact, it is better than twice as fast as the best compiler version.

```

DFE3:      39 PTRGET EQU $DFE3      ; GET VARIABLE NAME
DEBE:      40 CHKCOM EQU $DEBE     ; CHECK FOR COMMA
EAF9:      41 MOVFM EQU $EAF9      ; MOVE (Y,A) INTO FAC
EB2B:      42 MOVFM EQU $EB2B      ; MOVE FAC TO (Y,X)
E6FB:      43 CONINT EQU $E6FB     ; INT(FAC) AND STORE IN X-REG
EB93:      44 FLOAT EQU $EB93      ; FLOAT ACC. AND STORE IN FAC
E7BE:      45 FADD EQU $E7BE
          46 ORG $300
          47 JSR CHKCOM
          48 JSR PTRGET
          49 STA ARRAYLW
          50 STY ARRAYHI
          51 JSR CHKCOM
          52 JSR PTRGET
          53 STA CLW
          54 STY CHI
          55 JSR CHKCOM
          56 JSR PTRGET
          57 JSR MOVFM
          58 JSR CONINT
          59 INX
          60 STX M
          61 JSR CHKCOM
          62 JSR PTRGET
          63 JSR MOVFM
          64 JSR CONINT
          65 INX
          66 STX N
          67 LDA #0
          68 STA I
          69 STA J
          70 JSR FLOAT
          71 LDA ARRAYLW
          72 LDY ARRAYHI
          73 DOLoop
          74 INC I
          75 LDA I
          76 CMP M
          77 BEQ CHANGE1
          78 JSR ARRYPT
          79 JMP DOLoop
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```

We will use the subroutines ARRYPT, MULT, and MULT5 in subsequent columns, so I suggest you save them together on a single file on your machine language disk.

Well, that's it for this month. Next month, we'll see how to add two arrays from machine language.

Till then, good luck!

The doctor is out.

```

10 N = 50:M = 50:C = 0
20 DIM A(M,N)
30 D$ = CHR$(4)
40 PRINT D$"BLOAD
   ARRAY ADDER3.DBJO"
50 FOR I = 1 TO M
60 FOR J = 1 TO N
70 A(I,J) = 1
80 NEXT J
90 NEXT I
100 CALL 768,A(0,0),C,M,N
110 PRINT C

```

LISTING #2

```

0350:A9 00 00 CHANGE1 LDA #$00 ; RESET I TO ZERO
0352:85 00 81 STA I
0354:E6 01 82 INC J ; NOW, INCREMENT J
0356:A5 01 83 LDA J ; PREPARE TO TEST FOR END OF LOOP
0358:05 03 84 CMP N ; END OF LOOP?
035A:F0 06 85 BEQ CHANGE2 ; IF 50, PREPARE TO EXIT
035C:20 6A 03 86 JSR ARRYPT ; IF NOT, GET POINTER TO A(I,J)
035F:4C 3F 03 87 JMP DOLoop ; RETURN TO LOOP
0362:A6 E2 88 CHANGE2 LDX CLW ; GET L.O. ADDRESS TO C
0364:A4 E3 89 LDY CHI ; GET H.O. ADDRESS TO C
0366:20 2B EB 90 JSR MOVMF ; MOVE FAC TO (Y,X); C = FAC
0369:60 91 RTS ; RETURN TO BASIC!!
036A: 92 ;XXXXXXXXXXXXXXXXXXXX
036A: 93 ;
036A: 94 ; ARRAY POINTER
036A: 95 ;
036A: 96 ; THIS PROGRAM CALCULATES
036A: 97 ; THE INDEX OFFSET FOR AN
036A: 98 ; ARRAY WHOSE BASE MEM.
036A: 99 ; LOCATION IS FOUND USING
036A: 100 ; THE 'PTRGET' ROUTINE.
036A: 101 ; THE ARRAY IS AN (M,N)
036A: 102 ; MATRIX, AND THE INDEX OF
036A: 103 ; INTEREST IS (I,J).
036A: 104 ;
036A: 105 ;XXXXXXXXXXXXXXXXXXXX
036A:A5 01 106 ARRYPT LDA J ; PICK UP THE INDEX J
036C:85 98 107 STA MPRAD ; STORE IN TEMPORARY VARIABLE
036E:A5 02 108 LDA M ; DO THE SAME FOR M
0370:85 97 109 STA MPAD
0372:20 92 03 110 JSR MULT ; MULT MULTIPLIES MPAD BY MPRAD
0375: 111 ; AND STORES THE RESULT IN (RSLTW/RSLTHI)
0375: 112 CLC ; ADD '1'
0376:A5 00 113 LDA I ; PREPARE TO ADD I TO THE RESULT
0378:65 95 114 ADC RSLTW ; ADD THE LOW BYTES
037A:85 93 115 STA MPDLM ; AND STORE IN A TEMPORARY VAR.
037C:A9 00 116 LDA #$00
037E:65 96 117 ADC RSLTHI ; THEN ADD THE CARRY (IF ANY)
0380:85 94 118 STA MPDHI ; AND STORE AS WELL
0382:20 AD 03 119 JSR MULT5 ; MULT5 MULTIPLIES (MPDLM/MPDHI)
0385: 120 ; AND STORES THE RESULT IN (RSLTW/RSLTHI)

```


ANNA PEEL: PART II

Last month, Elliot and I put out a call for volunteers for the NEAT booth at this year's APPLEFEST. I don't know what we said, but it worked; the response has been tremendous! At last count we had 24 people signed up! El and I would like to thank the following people:

Gary Widiger
Bert Collins
David Landman
David Neumann
Bob & Carol Morris
Jeff Goldm--
David Lynn
Roger Geffen
Alonso Garza
Terry Scheller

Mat Leupold
Tom Hamilton
Joe Stivaletta
Guy Desloovere
Raines Cohen
Peter Fishman
Sam Ezust
Mark Hessman
Rob Josephs
Alan Kleinman
Eileen Entin

We've got a great balance of people at the booth this year, and I look forward to a good exhibit.

Be sure to drop by and say hello while you are at the show! Our thanks again to all the folks who have signed up!

John & Elliot

```

155 ;
156 ;XXXXXXXXXXXXXXXXXXXX
157 ;
158 ;MULT5 MULTIPLIES
159 ;MPDLW/MPDHI BY 5
160 ;AND LEAVES THE RESULT IN
161 ;RSLTH/RSLTHI
162 ;
163 ;XXXXXXXXXXXXXXXXXXXX
164 ;
165 MULT5 LDA MPDHI
166 STA RSLTHI
167 LDA MPDLW
168 ;FOR SOME REASON, THE ASSEMBLER
169 ;IN THE DOS TOOL KIT DOES NOT
170 ;RECOGNIZE 'ASL' WITH ACCUMULATOR
171 ;ADDRESSING. WE FOOL IT BY LOADING ITS HEX CODE ($0A)
172 ;WITH A 'DEFINE BYTE' (DFB) STATEMENT
173 ;
174 DFB $0A ; MULTIPLY BY 2
175 ROL RSLTHI
176 DFB $0A ; AND AGAIN
177 ROL RSLTHI
178 CLC ; ADD 4*(MPDHI,MPDLW)+
179 ; (MPDHI,MPDLW)
180 ADC MPDLW
181 STA RSLTHI
182 LDA MPDHI
183 ADC RSLTHI
184 STA RSLTHI
185 RTS
03AD:
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03AD:A5 94
03AF:85 96
03B1:A5 93
03B3:
03B3:
03B3:
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03B3:
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03B3:0A
03B4:26 96
03B6:0A
03B7:26 96
03B9:18
03BA:
03BA:65 93
03BC:85 95
03BE:A5 94
03C0:65 96
03C2:85 96
03C4:60

```

*** SUCCESSFUL ASSEMBLY: NO ERRORS



THE WORLD'S LARGEST EXPOSITION EXCLUSIVELY FOR APPLE OWNERS

Each show features hundreds of exhibits of the newest, state-of-the-art products for the Apple. You can see and try out software for every conceivable application—from arcade games to investment programs, music to machine language, teaching systems to accounting packages, word processors to graphics processors. You can sample hundreds of different peripherals, including printers, hard disks, modems, memory cards, video displays and synthesizers, plus accessories, publications and invaluable support services.

Applefest is **the** place to view the most technologically advanced products for the Apple.

At Applefest you can try out and compare hundreds of products in an exciting, information-filled environment. You can learn more in two days than you could in months of visiting computer stores and reading trade journals.

And, best of all, everything on display at Applefest is for sale at special show prices, so you can save hundreds—even thousands—of dollars by making your purchases at the show.

This year a whole new conference program is being introduced to Applefests nationwide. The program will show

you how to squeeze absolutely the most power, versatility and usefulness out of your Apple.

Seminars and workshops will teach you the ins and outs of buying software intelligently, using spreadsheet and database programs, putting Apples to work in classrooms and using the Apple as a management tool. You'll learn about new programming languages, important applications for telecommunications, exciting ways to use graphics and more.

No matter what you do (or want to do) with your Apple, the Applefest seminars and workshops will help you do it better. Software Spotlights will provide an in-depth, understandable look at hundreds of different software packages. Each Spotlight will cover the features, capabilities and limitations of a group of packages, to help you find the software that's best suited to your applications. Experts will be on hand to answer all your questions.

So plan on attending Applefest for 1983—the biggest and best Apple-user show ever. It'll be a mind-expanding experience for both you **and** your Apple.

Daily Registration Fees

Exhibits-only badges are \$8 per day, and the Conference Program is \$15 per day.

Special Pre-Registration Discount

If you plan to attend Applefest save now with advance registration. Three-day Exhibits and Conference badges are \$48, you save \$21. Three-day Exhibits only badges at \$18, you save \$6.

Additional Information

To receive more information about attending or exhibiting at Applefest, including the Conference, Seminar, Workshop and Panel Discussions Program, or information on local hotels call 617-739-2000 or 800-841-7000 (Boston).

Applefest/Anaheim:

Friday-Sunday, April 15-17, 1983
Anaheim Convention Center
10:30AM-5:30PM daily

Applefest/Boston:

Friday-Sunday, May 13-15, 1983
Bayside Exposition Center
10:30AM-5:30PM daily

Applefest/San Francisco:

Friday-Sunday, October 28-30, 1983
Moscone Center
10:30AM-5:30PM daily

Produced by Northeast Expositions, nationwide producers of the National Computer Shows, PC '83 and CP/M'83, 826 Boylston Street, Chestnut Hill, Massachusetts 02167.

Any Questions? Call 800-841-7000 (Boston)

Last Plea for Volunteers From Dave Reed

As this is my last issue as Editor/Publisher of the newsletter, this is also the last time you will have to read one of my pleas for help. We saw good response to John Shaw's plea for help in the booth at AppleFest and Mike Gooding got good response to his plea for reviewers of software so there is still hope.

We still need people to run for office at the election on the 18th and many of the non-elected positions are still available so look down this list and reread the descriptions in last months newsletter and pick your spot. Please call Jerry Connely or Jeannine Giffie at (617) 497-9050 to submit your nomination and give them a little background so that you may be properly introduced to the group on election night.

Remember, you should be willing to make a commitment to performing the duties and coordinating your activities with the Officers at least once a month at the steering committee meeting or over the phone and once more each month at the regular monthly meeting.

OFFICES AND POSITIONS

President.....	Terry Scheller 244-4833
Vice President, Programs.....	
Second Vice President.....	
Treasurer.....	
Secretary.....	
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Production Staff.....	
Editors/Writers.....	Dave Reed 692-7547
	Mark Hessman 475-2617
	
Membership Chairman.....	Joe Stivaletta 861-1899
Auditor.....	Don Foster
Advertising Managers.....	
Distribution Manager.....	Raines Cohen 965-0033
Store Distribution.....	
Archivist.....	Ed Fournier 369-6050
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Software Librarian.....Mike Gooding 264-4237

Software Reviewers.....

DDM Production.....Dr. Ronald Goldstein 273-0567

.....Ernie Mac Lauchlan 878-2229

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Greeter.....Jack Thompson 253-8608

Group Buyer.....

SysOp.....

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SIGPascal.....

SIGEd.....Jack Sheehan 924-1197

SIGCP/M.....Joe Stivaletta 861-1189

SIGComm.....

Post Office Pickup.....Dave Reed 692-7547

Special Project Chairpersons:

AppleFest.....John Shaw 643-2679

.....Elliot Entin 862-6418

School Computer Fairs.....

Non-Profit Status.....

Fund Raising Suppers.....

Swap Meets.....

Group Outings.....

Field Trips.....

You Name It.....

IAC News
by Dave Reed

The IAC will be having its Annual General Meeting of the membership at the Boston Applefest on Saturday the 14th of May. The time of the meeting will be 8AM to 10AM and the place will be the Bayside Exposition Center on Morrissey Blvd.

The april DOM was an educational disk from the Educational SIG.

The next DOM to be sent by the IAC will be a tutorial on Machine Language.

Last month's DOM never got to us so we will see if the Newton Apple Kids got theirs and make a copy. It was the IACBASE disk with Pascal Data Base & manual that we wrote about a while ago.

The IAC has also tried sending a newsletter of sorts on disk and we will report on that as soon as we get our copy.

TREASURER'S REPORT

March 1983

Beginning Balance..... \$ 2998.71

Revenues:

Membership Dues \$ 135.00

Expenses:

Newsletter printing \$ 331.54

Ending Balance..... \$ 2802.17

Respectfully Submitted,

Larry S. Stanes

From Pop to Micros
by Dave Reed

On May 2nd John Sculley moves from selling softdrinks to microcomputers when he replaces A.C. "Mike" Markkula Jr. as president of Apple Computer. This ends a three month courting by Apple which culminated in \$1 million up front, \$1 million in first year salary and bonuses and 350,000 shares of stock. Apple also helped him purchase a five-bedroom English Tudor on 1 1/2 acres with a view of San Francisco Bay that had listed at \$2 million.

Apple is about 1/4 the size of Pepsi which had sales of \$2 billion and outpaced Coca-Cola's growth during the last five years

under Sculley. He sees more than one analogy between his "Pepsi Challenge" advertising against Coke and the upcoming challenge with IBM in the business market with the Lisa.

The selection of a marketer like Scully is a definite sign of a change in direction from engineering to salesmanship. And that change in direction is what will be needed to compete with the likes of IBM. Scully also has experience dealing with independent dealers and has some definite ideas about making "sure the dealers have the resources they need." This should benefit us if he can improve the level of knowledge and support at the dealer.

MEMBERSHIP APPLICATION

1. Name _____ Date _____
2. Street _____
3. City _____ State _____ Zip _____
4. Phones (a) Home _____ (b) Work _____
5. Software background _____
6. Hardware background _____
7. What will you use your APPLE for? _____
8. In what area can the club assist you? _____
9. Are you available to assist other members? _____
10. Total amount enclosed _____

1983 Membership Dues are
UNITED STATES..... \$ 15.00
CANADA..... \$ 21.00

(OFFICE USE ONLY)

PAID BY: cash check RECEIPT # _____ STATUS: New Renewal MEM # _____

-DISKETTE ORDER FORM-

Diskettes are sold to members and non-members and can be picked up at the meeting or mailed anywhere in the continental U.S. Circle desired selection.

Games	I	II	III	IV	V	VI	VII					
Education	I	II		Math	I	Scientific	I	Applesoft Tutor				
Pascal	I	II	III	IV	V	VI	Diversi-DOS	ABBS	Hayes Util.			
D.O.M. 1981	J	F	M	A	M	J	J	A	S	O	N	D
D.O.M. 1982	J	F	M	A	M	J	J	A	S	O	N	D
D.O.M. 1983	J	F	M	A	M	J	J	A	S	O	N	D

All D.O.M.'s up to the current month \$5.00 picked up, \$6.50 mailed. The current D.O.M. is copied free on your initialized diskette at the meeting.

All categorized diskettes include a description of the programs and are available for \$5.00 if picked up and \$6.50 if they must be mailed.

Non-members prices are \$10.00 picked up and \$11.50 mailed.

Check here if you want diskettes mailed ().

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Make check payable to N.E.A.T.

ADDRESS _____

Send to:

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N.E.A.T.-Attn: Librarian

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members, e.g., swap notices,
personal articles for sale, etc.
accepted without charge.

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and white (half-tones are
permitted but no bleeds) by the
last Wednesday of the month
preceeding the month of issue to:

N.E.A.T. Notes
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P.O.Box 2652
Woburn, MA. 01801

